

Remarks

Reconsideration of this Application is respectfully requested.

Claims 32 and 34-53 are pending in the application, with claims 32, 34, 40, 43, and 51 being the independent claims. Claims 1-31 and 33 were previously cancelled.

Based on the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Amendments to the Specification

Applicants respectfully request the entry of the amendments to the specification. The amendment adds no new matter. Support for the amendments may be found at page 1, lines 13-14, incorporating DOCSIS Version 1.1 in its entirety. In particular, the Data-Over-Cable Service Interface Specifications, Radio Frequency Interface Specification, SP-RFIV1.1-I03-991105, Interim Specification, November 5, 1999 is referenced by specific section number throughout the specification as filed as "DOCSIS."

Rejections under 35 U.S.C. § 112

On page 2 of the July 18 Final Office Action, the Examiner rejected claims 40-53 under 35 U.S.C. § 112 ¶ 1, as failing to comply with the written description requirement. Applicant respectfully traverses. The Examiner stated "there is no support in the original specification" for certain claim features, further stating that the disclosure addressed only ranging and not resource allocation, and concluded that the original specification does

not convey to one skilled in the relevant art that the inventors had possession of the claimed invention at the time of filing. (Final Office Action, pages 2-5).

Applicants submit that the Examiner did not correctly characterize the disclosure of the specification as filed: all claim features are disclosed in the original application, and the specification as filed conveys to a person of skill in the art—read in the light of the DOCSIS specification as incorporated in its entirety and explicitly referenced throughout the specification by section number—that the inventors had possession of the claimed invention at the time of filing.

General Discussion of the Specification

In the Office Action, the Examiner stated, “[t]he disclosed invention deals only with a process or procedure allowing the CM [Cable Modem] to range on multiple channels, not the time slots or resource allocation in a DOCSIS system.” (Final Office Action, 2007, pages 4-5). The Examiner also stated, “the present invention . . . modif[ies] the ranging process of the DOCSIS standard.” (Final Office Action, page 3).

These statements incorrectly characterize the disclosure and the invention. The disclosure teaches both initializing (including ranging) and operating (including resource allocation) on multiple channels in a communication system (e.g., a cable modem system). The disclosure recites a complete initialization process for initializing on multiple channels, not merely a ranging phase.

Ranging is merely one phase of the eight phase DOCSIS initialization process. (See Specification, pg. 20, lines 25-29; DOCSIS 9.2; *see also* Amendments to the Specification (summarizing DOCSIS 9.2)). The specification describes in detail a modified initialization process, not a mere ranging process, which incorporates these

eight steps and additional steps to initialize, including ranging, on additional channels.

The DOCSIS steps are explicitly identified in the Specification as filed at page 19, line 14 - page 23, line 22; and page 24, lines 25-35; see also FIG. 9. The additional steps are at page 23, line 22 - page 24, line 26; see also FIG. 9 steps 914-920.

The disclosure further describes time slot and other resource allocation for operation on multiple channels. For example, the specification explicitly teaches that upstream communications require the CMs to be “assign[ed] time slots within which cable modems having a message to send to the cable modem termination system are allowed to transmit.” The description in the Specification as filed further details an exemplary process by which a CM requests time slots and the CMTS assigns them. (Specification, pg. 6, line 27 - pg. 7, line 8). The DOCSIS specification, which was incorporated in its entirety, clearly recites this process. The “Upstream Resource Allocation” section in the Amendments to the Specification summarizes the referenced DOCSIS sections.

Moreover, in DOCSIS, the CMTS controls access to time slots by transmitting a MAP message on the downstream channel. (*See* Specification, pg. 10, line 35 - pg. 11, line 3; *see also* DOCSIS 7.1; Amendments to the Specification). The Specification as filed discusses a MAP message in very fine detail. (*See* FIGs. 4, 5; pg. 10, line 33 - pg. 14, line 12).

The Specification as filed also discusses requesting time slots and other resources based on packet length: “A CM with a large amount of data to transfer would generally prefer to use the wideband channel for its higher burst capacity. The narrowband channel may be utilized for short packets. . . . A request for a grant of 14 mini-slots or more is

indicative of a long packet requiring transmission over a wideband channel. A request for a grant of 13 mini-slots or less is indicative of a short data packet requiring transmission over a narrowband channel.” (Specification, page 17, lines 1-13; *see also* pg. 2, lines 13-19).

Specifically, the Specification as filed describes two methods of allocating time slots and other resources for multiple channel operation. “In the first method, the CM transmits a request in mini-slots to the headend indicating there are packets that require transmission. In the second method, the CM transmits a request in bytes to the headend indicating there are packets require sending.” (page 2, lines 20-22; page 16, lines 25-28). “The headend may respond to a request for a long data packet with a grant in the narrowband channel, or if there is a deficit of short packets, may use the narrow channel rather than let it idle.” (page 18, lines 3-6).

In these situations, the term *maintaining ranging* is used to imply maintaining the ability to transmit on more than one channel by ‘remembering’ the necessary parameters. (See pg. 14, lines 12-21; pg. 16, lines 33-36).

Thus, the Specification as filed describes initialization on multiple channels and the allocation of time slots and other resources for operating on multiple channels, including the storage of the necessary parameters.

Specific Claim Elements

The claim elements referenced by the Examiner have support in original Specification as filed and also in the references incorporated in their entirety. For example:

(1) *“storing at least one first user unique parameter corresponding with a first carrier frequency”* (as recited in claims 40-42)

According to the specification, “[u]ser unique’ parameters include power level, offset frequency and ranging offset. A complete list of ‘burst profile’ and ‘user unique’ parameters are listed in DOCSIS. (See DOCSIS section 4.2.7.)” DOCSIS 4.2.7 elaborates (as described in the aforementioned amendment to the specification), and recites additional specific user unique parameters including burst length and transmit equalizer coefficients. Thus, user unique parameters are described in the specification as filed.

The specification also describes storing at least one user unique parameter corresponding with a first carrier frequency. As described in the specification as filed,

[i]t is generally understood that a CM is initialized or ranged on a single channel, using burst profiles optimized for these initialization purposes, and then proceeds to use other burst profiles on this channel for requests and data communication. DOCSIS does not provide that a CM is ranged or initialized on two or more channels at the same time; *in fact, there is no provision requiring the CM to store more than one set of user unique parameters, for example. . . .* Currently, CMs cannot change back and forth between channels seamlessly. They cannot maintain a “ranged” (power level, fine frequency, timing, and even transmitter equalization) condition on more than one carrier frequency at a time.

(pg.13, lines 24 - pg. 14, line 15) (emphasis added). Thus, the Specification teaches storing at least one user unique parameter corresponding to one carrier frequency.

(2) *“storing at least one second user unique parameter corresponding with a second carrier frequency that is different from the first carrier frequency”* (as recited in claims 40-42);

As quoted from the specification above, DOCSIS CMs “maintain ranging” on one channel by storing at least one user unique parameter corresponding to a carrier frequency. In an embodiment of the invention, however, “the CM maintains ‘ranging’ on at least two carrier frequencies, or channels; at least one channel is narrowband and at least one channel is wideband.” (Specification, pg. 16, lines 34-35). Thus, the specification describes storing at least one second user unique parameter corresponding with a second carrier frequency different from the first carrier frequency.

(3) “*wherein the at least one first user unique parameter includes at least one selected from the group consisting of a transmit power level, fine frequency tuning information, timing information, and transmit equalization information*” (as recited in claim 41);

As discussed in claim feature (1) above, user unique parameters are defined in the specification as filed to include power level, offset frequency (fine frequency tuning information), ranging offset (timing information), and transmit equalizer coefficient.

(4) “*allocating a wide-band channel for transmission of relatively long packets*” (as recited in claims 43-50);

The Specification as filed describes allocating wideband channels and reasons to use wideband channels for transmission of relatively long packets.

Channel allocation occurs during initialization. First, the CM coordinates with the CMTS to determine an acceptable upstream channel. After finding a downstream channel, the CM waits for a UCD message. The CM extracts the parameters for the upstream channel from the UCD and determines if it can use the channel. (See pg. 20, lines 2-19). The UCD includes, *inter alia*, channel symbol rate and frequency. (See

DOCSIS 6.3.3; *see also* Amendments to Specification). The CM then attempts to range on that channel. (*See* pg. 20, line 25 - pg. 21, line 27).

When the CM initializes on multiple channels (*see* general discussion above), it may ensure that it initializes on at least one wideband channel. (*See* pg. 2, lines 10-13; pg. 17, lines 1-3). Wideband channels (e.g., higher frequency) may be preferable for longer packets as they have a high data rate advantage; transmitting shorter packets on narrowband channels (lower frequency) may provide better resistance to impulse noise. (*See* pg. 14, line 23 - pg.15, line 16; FIGs. 6, 7).

(5) *“allocating a narrow-band channel for transmission of relatively short packets”* (as recited in claims 43-50);

The Specification as filed describes a process of allocating narrowband channels and reasons to use narrowband channels for relatively short packets. A narrow band channel may be allocated during initialization in the same manner as described above.

When the CM initializes on multiple channels (*see* General Discussion of Specification above), it may ensure that it initializes on at least one narrowband channel. (*See* pg. 2, lines 10-13; pg. 17, lines 1-3). Narrowband channel (e.g., lower frequency) generally possess a lower data rate, but have a better resistance to impulse noise for short packets. (*See* pg. 14, line 23 - pg.15, line 16; FIGs. 6, 7).

(6) *“transmitting a data packet having a data packet length using either the wide-band channel or the narrow band channel based on the data packet length”* (as recited in claims 43-50);

The Specification as filed describes this element as described in the General Discussion of the Specification and in claim features (4) and (5) above. In general, after

initializing on multiple channels, the CM may request time slots which may be granted by the CMTS on any of the channels. (See General Discussion of Specification above).

(7) *“allocating a first carrier frequency for communication of comparatively short packets using a comparatively low symbol rate”* (as recited in claims 51-53);

The Specification as filed describes this element. The carrier frequency for a channel is one of the channel parameters, and the terms are sometimes used interchangeably in the specification. For example, see pg. 2, lines 10-11 (“ . . . a CM can be ranged on at least two carrier frequencies, or channels, at least one channel is narrowband”); see also pg. 13, lines 7-8 (“‘Channel’ parameters include the carrier frequencies available to the CMs.”). The Amendments to the Specification include a listing of channel parameters from DOCSIS section 4.2.7. DOCSIS section 4.2.7 was explicitly referenced on page 13 of the specification as filed.

Thus, as described in claim feature (5), this element is described by the specification as filed.

(8) *“allocating a second carrier frequency that is different from the first carrier frequency for communication of comparatively long packets using a comparatively high symbol rate”* (as recited in claims 51-53).

For reasons similar to element (4) and (7), this claim feature is fully described in the specification as filed.

Conclusion

For at least the reasons above, each element of claim features (1)-(8) is disclosed in the original specification as would be understood by one skilled in the relevant art at

the time the application was filed. The DOCSIS specification, which was incorporated by reference in its entirety at the time of filing, describes background knowledge possessed or available to one of skill in the art. Amendments to the Specification are included to incorporate this background information into the specification to assist the reader in understanding the invention.

The referenced sections of the specification in light of the background information in the incorporated DOCSIS specification support the language of claim features (1) - (8). As a whole, the disclosure provides the needed written description under 35 U.S.C. § 112 to “convey[] with reasonable clarity to those skilled in the art that, as of the filing date sought, applicant was in possession of the invention as now claimed” (M.P.E.P. § 2163.02, citing *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64 (Fed. Cir. 1991)).

Accordingly, Applicants request that the rejection of claims 40-53 be reconsidered and withdrawn.

Objection to the Specification

On page 2 of the July 18 Final Office Action, the Examiner objected to the amendment filed April 16, 2007, asserting that the “newly added specification on pages 3-4 of the amendment” and the “newly added FIGs. 14-17” introduce new matter under 35 U.S.C. § 132(a). Applicant respectfully traverses.

Applicant submitted new drawing sheets including FIGs. 14-17 and corresponding amendments to the specification, along with citations demonstrating support for all changes to more clearly show every feature of the invention specified in

the claims as required under 37 C.F.R. 1.83(a). (*See* April 16, 2007 Amendment, pages 3-4, 21-23).

For at least the reasons similar to those set forth above with respect to the rejection under 35 U.S.C. § 112 and in the Applicant's April 16, 2007 Amendment, Applicant asserts that the specification fully discloses these features. Therefore, FIGs. 14-17 and the amendment to the specification on pages 3-4 of the April 16, 2007 Amendment are not new matter and do not require cancellation by the Applicant.

Applicant respectfully requests reconsideration and withdrawal of the objection to the specification.

Allowable Subject Matter

Applicant acknowledges with gratitude the Examiner's allowance of claims 32 and 34-39.

Other Remarks

With respect to the present application, Applicant hereby rescinds any disclaimer of claim scope made in the parent application or any predecessor or related application. The Examiner is advised that any previous disclaimer of claim scope, if any, and the alleged prior art that it was made to allegedly avoid, may need to be revisited. Nor should a disclaimer of claim scope, if any, in the present application be read back into any predecessor or related application.

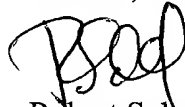
Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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